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ABSTRACT

In a study of the effects of time restrictions and passage access on reading comprehension, 128 college freshmen enrolled in two different developmental reading courses were divided into 4 groups of 32 subjects each. (Tests used to assess reading ability at the college level are usually either power tests with liberal time limits, or speed tests, which are strictly timed. Both provide access to the passage.) Group 1 had no passage access and no time limit; group 2 had no passage access and a 15 minute limit; group 3 had passage access and no time limit; and group 4 had passage access and a 15 minute limit. The results of this study conflict with those of other research, which support the findings that increased time restrictions do not yield higher test scores while passage access does. The two groups who had no time restrictions scored significantly higher than those with a 15 minute limit, and the two groups who had no passage access did just as well as the two groups who were permitted access. Across all groups there were no significant differences between comprehension and retention scores. Several conclusions might be drawn from these results. Developmental college students have problems processing connected discourse and, as a result, their metacognitive abilities are weak. Though unrestricted time limits are often impossible, perhaps unrestricted time on reading tests would be beneficial. More research on developmental college students must be done before accurate conclusions can be drawn. (SRT)

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The Effect of Passage Access and Time Restrictions on the Comprehension and Retention of Connected Discourse

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The effect of passage access and time restrictions on the comprehension and retention of connected discourse

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Tests used to assess reading ability at college level generally fall into one of two categories — power tests or speed tests. Speed tests, such as the *Nelson-Denny Reading Test* (1976), are highly timed and provide a measure of vocabulary, comprehension and speed. Power tests, such as the *McGraw-Hill Survey Test* (1974), have more liberal time limits and attempt to diagnose more specific reading weaknesses. Both of these tests allow for passage access while answering the comprehension questions. But what effects do these two factors — time and passage access — have on the assessment of reading comprehension for students enrolled in a college developmental reading program?

Two Elements of Reading Tests

Reading tests tend to be product rather than process oriented. That is, the information sought from the tests is usually a score instead of an assessment of ongoing reading strategies. Students are generally given a passage (or passages) to read and then are instructed to answer a series of questions about the selection, traditionally in a multiple-choice format. The number of items correct yields a comprehension score based on a norming group. In most cases, students can refer back to the passage for verification or clarification when answering questions. It is assumed that passage access provides a better estimate of the amount comprehended since the memory aspect has been removed.

The theoretical relationship between memory and reading comprehension is interesting to explore, especially as it is related to the reading of connected discourse. It is indeed a complex relationship since it includes activating prior knowledge for initial understanding (Bransford & Johnson, 1972), using deeper levels of processing so that information can get from short-term to long-term memory (Rundus, 1971), and finally being able to retrieve the information at the appropriate time once it is placed in long-term memory (Tulving & Pearlston, 1966). Because of this complex series of events, it is hardly surprising that it is difficult to unravel all of these aspects and to determine just to what extent one affects the other. Research indicates that prior knowledge affects the amount of information comprehended (Johnson, 1981), but what effect does passage access have on an individual's ability to perform better on a test of reading comprehension? Common sense indicates that the answer to this question is obvious. That is, it seems certain that individuals would be able to do better on a series of multiple-choice questions if they were permitted access to the passage than if they were denied access.

The research relating to the topic of access versus no access is scant and hence inconclusive. In fact, only two studies could be located which directly address this issue; only one of the two used college students as subjects. In investigating the advantages of studying summaries over actual text, Reder and Anderson (1979) permitted college subjects access to the text when answering a series of true/false questions. Even with text available, the mean accuracy rate in answering direct and indirect questions was very close indicating that access did not provide an advantage for questions whose answers were readily available in the text. As a result of interviews

conducted with subjects, the researchers concluded that passage access was beneficial only if students used a type of information search strategy.

Johnson (1981), however, found that availability of text was an important factor in evaluating reading comprehension. His findings indicated that students do better on questions testing peripheral information (details) when they have passage access but that access hinders comprehension on questions testing central information (main ideas).

A related study by Garner (1982) sought to determine if there was a difference between students who were identified as good comprehenders and those who were poor comprehenders on their ability to look up answers to interspersed questions if they were permitted passage access. Students in both groups were trained in facilitating comprehension using lookbacks. Garner found that while training and practice improved performance for all subjects, good comprehenders were much more likely to go back and look up the answers to questions they did not know.

While additional studies have investigated text lookbacks, the Reder and Anderson study and the Johnson investigation are the only ones which have dealt directly with the issue of access. Since they were conducted using different aged subjects and since the results were conflicting, no generalizations can be drawn.

Greater consistency in findings exist in studies which have manipulated the time factor. Generally subjects' performance does not significantly improve by permitting additional time. When Reder and Anderson increased the time allotment by 10 minutes for one group, no significant differences were present between the group who had 20 minutes and the group who had 30 minutes.

Similar findings occurred when Wild, Durso, and Rubin (1982) investigated the effect of increased test-taking time on the Graduate Record Exam by ethnic groups, years out of school, and sex. Their results indicated that even though a larger portion of the examinees completed the test when they were allotted more time, the extra time did not differentially help any of the groups studied.

Thus, the research dealing with passage access versus no passage access has produced conflicting evidence about the effects of these factors on comprehension. Passage access may make a difference depending on the type of questions asked. The research on the time factor, however, points to the fact that increased time spent on the reading task yields either no significant increase in comprehension scores or only a very small increase.

Purpose of the Study

The purpose of this study was to answer the following questions:

1. Would college developmental reading students perform better on a test of reading comprehension and subsequent retention if the time restrictions were removed?
2. Would college developmental reading students perform better on a test of reading comprehension and subsequent retention if they were allowed access to the passage?
3. Would the interaction between passage access and time restriction produce significantly different comprehension and retention scores?

METHODOLOGY

Subjects

The subjects for this study were 128 freshmen students enrolled in several sections of either 096R or 098R, two different developmental reading courses offered at a major university. The former course is for students who need additional help in obtaining reading fluency; the latter course utilizes a content area approach to reading and concentrates on teaching students how to process textual information. All of the subjects were accepted into

the developmental studies program since their SAT scores and/or high school grade point averages were below those needed for regular admission to the university. The majority of the subjects were of Caucasian background (74.6%); 51.7% of the students were male. The average Scholastic Aptitude Test Verbal (SATV) score of the subjects was 360 and ranged from a low of 200 to a high of 550. The mean high school grade point average was 2.61.

Design

Subjects were randomly assigned to one of four treatment groups, each group containing 32 subjects. Group 1 had no passage access and no time limitations (NA/NT); Group 2 had no passage access and a 15 minute time limitation (NA/T); Group 3 had passage access and no time limitations (A/NT); and Group 4 had passage access and a 15 minute time limitation (A/T). Each participant was randomly given a packet of materials which contained directions for carrying out the task, the reading passage, and for those in Groups 3 and 4, the comprehension questions. They were told to read the instructions carefully and to ask questions concerning the task. All subjects then read a 1,000 word passage on hibernation and immediately following the reading answered a series of 18 multiple-choice questions. One week following the initial reading of the passage all subjects were given the 18 items on a retention test. Both the questions and the foils were reordered for the retention task. All groups were given as much time as needed during the retention task. The test-retest reliability of the test was .75 and the items were found to be passage dependent. The internal consistency of the entire test was .72.

Analysis of the Data

The present study was a 2 x 2 x 2 factorial design with two between-subjects variables and one within-subject variable (Myers, 1979, p. 210). The data were analyzed with the Biomedical computer program (BMDP, 1979) for analysis of variance and repeated measures. The comprehension and retention measures were the two trial factors, while access and time were the grouping factors.

RESULTS

Table 1 shows the means and standard deviations for each group on the dependent variable. The two groups who had no time restrictions (A/NT and NA/NT) had a higher mean score on both comprehension and retention than the two groups who had the 15 minute time restriction (A/T and NA/T). However, there was no such pattern between the means for the access versus no access groups. Additionally, within each group, the means for comprehension and retention are very close.

Three main effects were tested in the study. Only the time restriction main effect (T) was statistically significant $F(1, 128) = 7.84$, $p = .006$. The two groups who had no time restrictions during the initial reading of the passage scored significantly higher on the dependent variable than those who had the 15 minute time limitation.

There was no main effect for access (A), $F(1, 128) = 2.04$, $p = .155$. Referring to the means for each group shown in Table 1, it can be seen that the two groups who did not have access performed similarly to the two groups who had passage access.

Across all treatment groups there were no significant differences between comprehension and retention scores (R), $F(1, 128) = .247$, $p = .620$. Subjects tended to do just as well on the retention questions as they did on the comprehension questions no matter what treatment they received.

Finally, of the three interactions tested, none were found to be significant. Implications of this finding will be addressed in the following section.

Table 1
Means and Standard Deviations for Each Group on the Dependent Variable

	Repeated Measure			
	Comprehension		Retention	
Group*	Mean	Standard Deviation	Mean	Standard Deviation
1. NA/NT	11.15	2.02	10.73	2.49
2. NA/T	10.06	3.33	10.30	2.91
3. A/NT	11.88	1.83	11.85	1.92
4. A/T	10.45	2.59	10.33	2.35

*1. NA/NT: No Access; No Time Restrictions
2. NA/T: No Access; 15 Minute Time Restriction
3. A/NT: Access; No Time Restrictions
4. A/T: Access; 15 Minute Time Restriction

DISCUSSION

The results of this study conflict with other research on passage access and time restrictions. In fact, the literature consistently supports the finding that increased time restrictions do not yield higher test scores. In this investigation the opposite was found to be true. The two groups who had no time restrictions scored significantly higher than the two groups who had the 15 minute time limitation. Additionally, some past research also indicates that passage access does make a difference. That is, those who are permitted access to a passage when answering a series of comprehension items do significantly better than those who do not have access. Again, the results of this study do not support this finding. The two groups who had no passage access did just as well as the two groups who were permitted access.

It is also puzzling that across all groups there were no significant differences between comprehension and retention scores. This finding conflicts with the theory of forgetting meaningful information (Spitzer, 1939).

Finally, the lack of interactions is in direct conflict with theories of information processing. More specifically, access with no time restrictions should allow for deeper levels of processing (Craik & Lockhart, 1972) and, therefore, better comprehension and recall. Access with time restrictions should allow for good performance on the comprehension questions since the subjects could glance back quickly for cues, but less efficient recall because they did not have to process at a deeper level.

When attempting to interpret these results, the first important consideration to explore is the nature of the sample. Tierney (1982), defines immature readers as those who tend to read superficially, have poor concentration, and use few rehearsal techniques when attempting to learn new material. The majority have weak metacognitive skills and, therefore, have a difficult time determining whether or not they understand what they read. Additionally, often when they do recognize that they are having difficulty comprehending, they don't know what to do about it, so they continue reading and become more lost or they simply give up. The subjects in this study certainly possessed these characteristics and thus, their reading processes appeared to differ from regularly admitted college students. The sample itself, therefore, may have been a determining factor in the results.

As was previously stated, the fact that the two groups who were permitted passage access while answering the comprehension questions did

not do better than those who did not have passage access was a surprising outcome of the study. On the surface it seems that if individuals could reread portions of a passage for clarification or verification they would be able to answer more items correctly, especially the group who had passage access and no time restrictions. There are several plausible answers why this did not occur which again may be due, in part, to the sample studied. First, research indicates that good readers will reread parts of a text when they are unsure of an answer to a question or don't understand a concept (i.e. Collins & Smith, 1980). Since the participants in this study had deficient reading skills, one of three things may have occurred: (a) students thought they knew the correct answer and, therefore, didn't bother to look it up (a metacognition problem); (b) they were too lazy, didn't care enough about the task, and simply guessed at the answer; or (c) they didn't know where in the text to locate the answer. All of these factors have implications for how developmental college students must be taught to process information more efficiently and effectively. These suggestions will be discussed in the following section.

Equally interesting was the finding that there was no main effect for the repeated measure (R). Spitzer's classic study on the retention of meaningful material revealed that after seven days students remembered about 38 percent of the amount initially comprehended. Given the fact that baseline in the present study (baseline is defined as the average number of correct items on the comprehension test taken immediately after reading the passage) was 10.88, according to Spitzer's findings we would predict the subjects would only get about four answers correct. However, the average score after seven days was 10.08, or 99.3% of baseline.

One possible reason why retention scores did not differ significantly from comprehension scores is that developmental studies students may retain as much as they initially understand. Since they rarely interact with text and subsequently often remember very little of what they read unless it is meaningful to them, it makes sense that they would be able to retain, for a week, limited information from the initial reading. That is, good students can readily synthesize and organize large amounts of information during their initial reading. However, those with deficient processing skills focus on information which is meaningful to them, but may or may not be relevant to understanding and remembering the major concepts presented. Additional support for this argument can be seen by re-examining Table 1. The close means between comprehension scores for all groups perhaps indicate that the subjects used very similar processing strategies regardless of their assigned treatment group. Additional time or passage access did not ensure differential processing to deeper levels or the use of effective rehearsal strategies. Hence, while the groups differed in the way they were instructed to carry out the task, their forgetting curves were similar.

The only statistically significant result of the study was the time factor on the combined comprehension and retention data. Those who had no time limitations did signficantly better than those who had 15 minutes to complete the task. Again, this finding conflicts with previous research conducted on the effects of increased time allotments. While the population studied may be one reason for this finding, another explanation may be that in other studies the time limitation was increased (i.e., from 20 to 30 minutes), but subjects did not have unlimited time. The fact that the subjects in the present study were permitted as much time as they needed in order to complete the task may have contributed to the statistical significance in the time variable. The unlimited time factor may have reduced anxiety considerably, or may have given the subjects the additional reading time they

needed since developmental students tend to read slowly and consequently require more time to complete the reading task.

Moreover, they tend to read superficially; that is, there is little interaction and internal dialogue taking place between reader and author. Consequently, those in the A/NT group had the advantage of being able to use lookbacks for questions they were unsure of, while those in the NA/NT group could spend as much time as they needed on the initial reading. From the results of this study, it would appear that for specially admitted college students, highly timed tests may not give an accurate measure of true potential.

CONCLUSIONS AND SPECULATIONS

The conclusions drawn from this study must be considered speculative, particularly since so few studies have been conducted on passage access and therefore no generalizations can be drawn. Additionally, the number of empirically based studies in the area of reading comprehension which have been conducted on deficient or developmental readers, on a whole, are scant. Because of this lack of research we know very little about what does or does not improve comprehension and subsequent retention of connected discourse for this particular population of students.

However, we speculate several ideas based on the results.

1. Developmental college students have problems processing connected discourse. This is evidenced by the fact the subjects who had passage access when answering the comprehension questions did not perform significantly better than those who had no passage access. Even with access and no time restrictions, the information was not processed sufficiently enough so that subjects could look back to the passage to find answers to questions to which they were unsure.
2. Because of inadequate text processing, metacognitive abilities of developmental college readers are weak. Again, this is evidenced by the fact that access produced no significant differences. Assuming that access was permitted and individuals realized that they did not know the answer to certain questions, the logical thing to do would be to return to the text and to look-up the answer. Subjects in this study either thought they knew the answer, and, therefore, did not bother to look it up, or they attempted to look it up and could not find it.
3. The subjects in this investigation appeared to retain as much as they initially understood as evidenced by the lack of significant differences between comprehension and retention scores. Perhaps this is also due to text processing problems but requires much more investigation before substantive conclusions can be drawn.
4. Based on the results, we speculate that unrestricted time on reading placement tests may be beneficial to developmental students. However, we also realize that in many instances unrestricted time limits are neither possible nor feasible.

The speculative findings made in this investigation will remain as such unless more data based reading research is conducted with developmental college students. Only then can generalizations be drawn. Their reading characteristics, the affective domain, the way in which they process text, and metacognitive skills which they possess are only a few areas that require additional exploration. Well designed experimental research will further help in clarifying where no patterns presently exist.

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